

## *Doryopteris majestosa* (Pteridaceae), a New Species from South America

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ABSTRACT.—A new species of *Doryopteris* is here described, illustrated and its diagnostic characters discussed. Material of the new taxon, *Doryopteris majestosa*, has been misinterpreted as *Doryopteris nobilis* as it has features similar to it, such as the lamina architecture and large fronds, but differs mainly in having proliferous buds at the base of the lamina amongst other characters.

KEY WORDS.—Cheilantheoideae, *Doryopteris*, Neotropical, Pteridaceae, South America

During a revision of the genus *Doryopteris* J. Sm. (Yesilyurt, in preparation), detailed nomenclatural studies were also carried out, taking into account ca. 218 names published within *Doryopteris*. Among these, *Doryopteris nobilis* (T. Moore) C. Chr. is well known, probably because it is one of the largest species of the genus, and several synonyms have been assigned to this taxon (Tryon, 1942). However, on checking its synonyms and types, it was noticed that all the names referred to plants without proliferous buds at the base of the lamina. The similarities of the lamina architecture (Fig. 1, A–D) and the size probably led to misidentification. Moreover, Tryon (1942) stated that *Doryopteris nobilis* ‘.. is characterized by ... the usual presence of buds at the base of the blade..’ thereby applying the name *D. nobilis* to what are considered here as two distinct taxa. All specimens with buds I therefore describe here as a new species, confirmed not only on morphological but also on the cytological evidence (Yesilyurt and Gibby, unpubl. data). Most of the terms used in this work follow Lellinger (2002).

***Doryopteris majestosa*** J. C. Yesilyurt, *sp. nov.* TYPE.—BRAZIL. **Rio de Janeiro, Itatiaia:** Estrada para os chales Terra Nova. Crescendo sobre rocha, próximo de córrego, local sombreado e úmido. *J. C. Yesilyurt 564, J. Prado & P. H. Labiak*, 18/01/1999 (holotype SPF; isotype BM). **Figs. 1–4.**

*Doryopteris majestosa* sp. nov. *D. nobilis* (T. Moore) C. Chr. affinis, sed gemmis ad basin laminae locatis (nec gemmis e lamina carentibus), petiolo tereti, lamina adaxialiter pubescenti, indumento ad basin laminae atque in venis maioribus densiore (nec pilis omnino sparsae) differt.

Plants terrestrial, occasionally rupicolous. *Rhizome* decumbent; scales lanceolate to ovate-lanceolate, with sporadically dentate margin, light-brown. *Sterile and fertile fronds* dimorphic, sub-coriaceous, with proliferous buds at the base of the lamina, adaxial surface with glandular hairs, usually

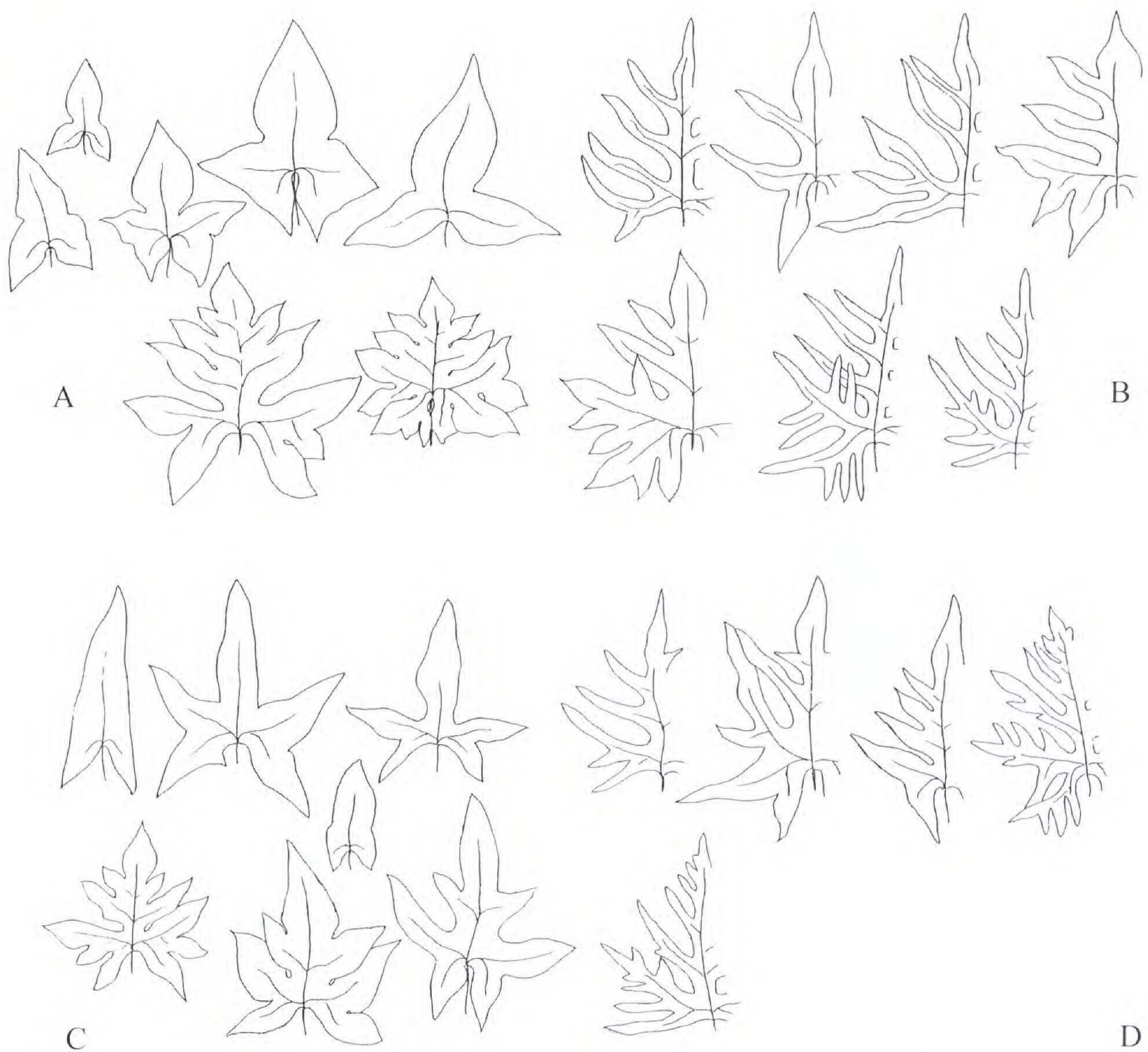


FIG. 1. Frond variation in *Doryopteris*. *D. majestosa* (A, B): A, sterile fronds; B, fertile fronds; *D. nobilis* (C, D): C, sterile fronds; D, fertile fronds.

concentrated at base of lamina and extending along the axes; abaxial surface glabrescent, indument of glandular hairs, microscales (simple and furcate) on the axes; veins anastomosing. *Petiole* terete to slightly sub-terete, brown to rarely dark brown, glabrescent, with hairs usually on the upper side of the petiole and more concentrated towards the base of lamina; scales same as those of rhizome, concentrated at the base of the petiole, those above more scattered, lanceolate to linear-lanceolate, usually caudate. *Sterile fronds* to 46 cm long; lamina to 29 cm long, sagittate, ovate-lanceolate to 3-5-lobate, occasionally pentagonal, pedate, usually broadly pinnatilobed, apex acute to acuminate; margin serrate with ascending teeth; hydathodes present. *Fertile fronds* to 80 cm long; lamina to 30 cm long, pentagonal, pedate to usually deeply 5-lobed, with 3-5 pairs of pinnae/segments, slightly ascending; apices acute to acuminate; sterile tips conspicuous, up to 1 cm long, with crenate to serrate margin; basal pinnae/segments pinnatifid to deeply pinnatilobed, asymmetric,



FIG. 2. *Doryopteris majestosa* J. C. Yesilyurt (*Yesilyurt 564 et al.*, SPF, holotype). A, habit; B, petiole indument: scales; C, sorus detail showing sporangia and indusium; D, segment apex; E, proliferous buds with new plants; F, petiole indument: hairs; G, proliferous buds at the base of the lamina (adaxial surface). Drawings by the author.

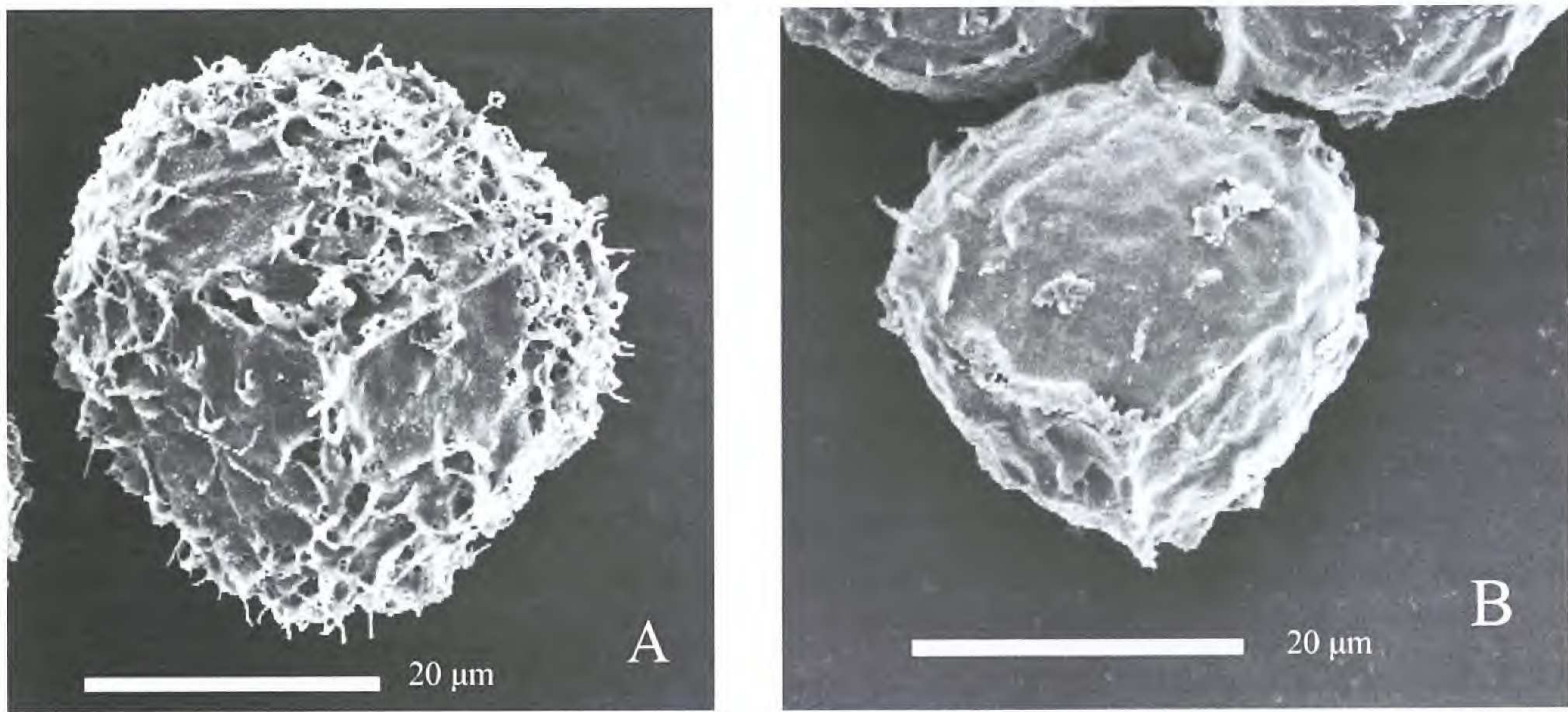


FIG. 3. SEM photomicrographs of *Doryopteris* spores. *D. majestosa* (A. Yesilyurt 564 et al.); *D. nobilis* (B. Yesilyurt, J. C. 542 & Prado, J.).

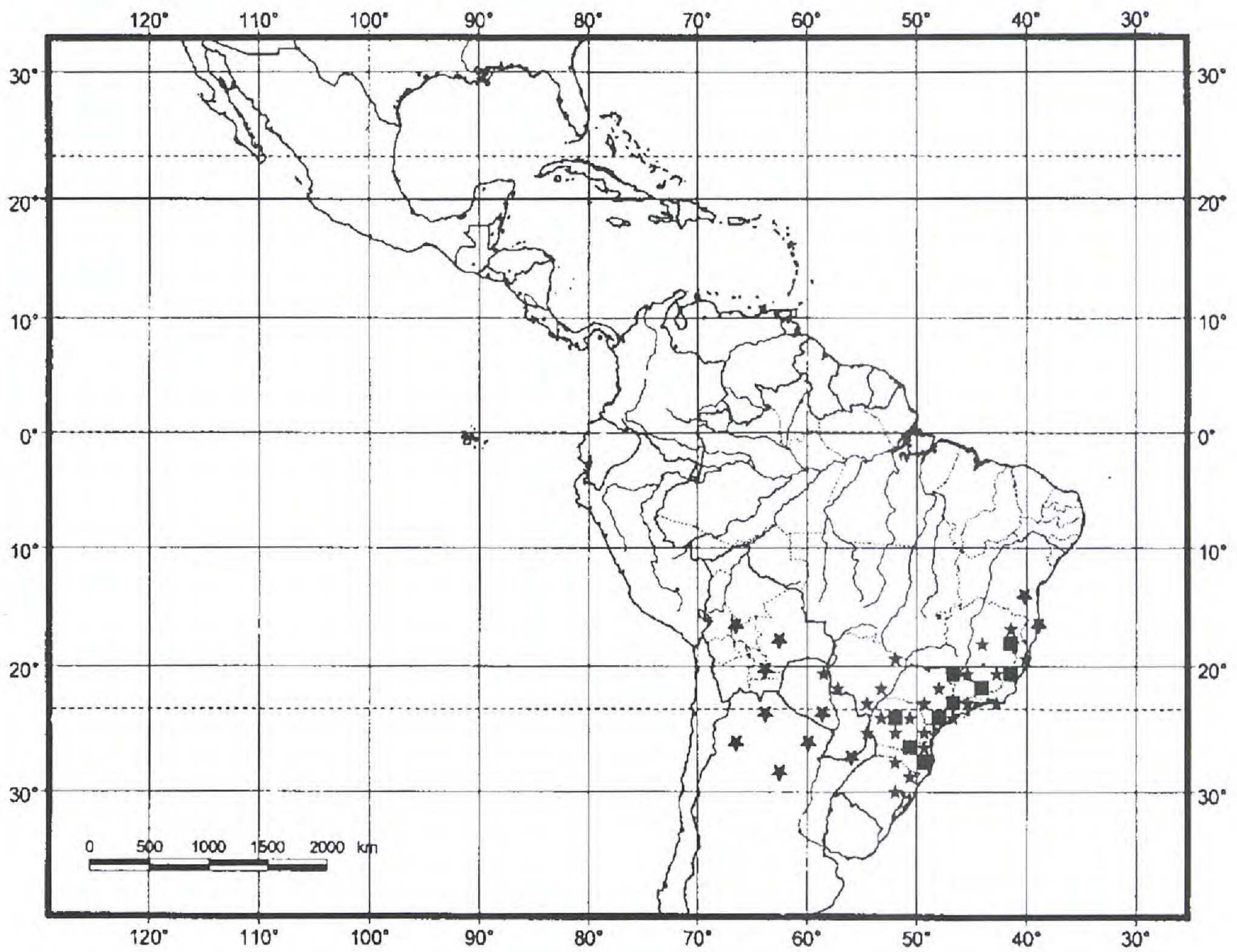


FIG. 4. Distribution of *Doryopteris*. *D. majestosa*: stars; *D. nobilis*: squares.

the basiscopic side being more developed and more dissected than the acroscopic side, broadly surcurrent; distal pinnae/segments predominantly lanceolate, rarely lobed, broadly sursumcurrent; inter-pinnae sinus inconspicuous to broad, rounded; apex of the lamina long-acuminate, tapering. *Sori* along a marginal vascular commissure, continuous around all sinuses; *receptacle and indusium* continuous, indusium with margin entire; *sporangium* up to 0.4 mm long, with stalk almost same length as capsule; capsule basal cell inconspicuous (to absent); annulus with ca 15–17 indurated cells. *Spores* light castaneous (whitish), cristate, 30–35  $\mu\text{m}$ .

The specific epithet given to this new *Doryopteris* species refers to its majestic appearance, due to the outstanding size and shape of the fronds. The specimens mentioned here as *Doryopteris majestosa* were previously identified as *D. nobilis*. Both species have similar lamina architecture (Fig. 1, A–D). *Doryopteris majestosa* however is a much larger plant and has a wider range of distribution than *D. nobilis* (Fig. 4). It can be distinguished from *D. nobilis* most easily by the presence of the proliferous buds at the base of the lamina (Fig. 2, E, G). These buds are also present in juvenile fronds. New plants of both species were grown from spores collected either from herbarium specimens or from the original plants and were cultivated under the same conditions for about two years at Chelsea Physic Gardens, London, UK. Buds at the base of the lamina were always present in *Doryopteris majestosa*. Furthermore, *Doryopteris majestosa* has a brown to dark red-brown, terete to sub-terete petiole with denser indument (ferruginous hairs) especially towards the base of the lamina (Fig. 2, F–G); light castaneous (whitish), cristate spores (Fig. 3A) and pubescent on both surfaces of the lamina (Table 1), especially on the main axis. Cytological data (Yesilyurt and Gibby, unpubl. data) also supports the distinction of both species; *Doryopteris majestosa* is triploid and *D. nobilis* diploid.

*Doryopteris majestosa* is relatively widely distributed in east central South America (Fig. 4). It occurs in northeastern (Bahia), southeastern (Minas Gerais) and southwards to southern Brazil (Rio Grande do Sul). It also occurs in central west Brazil (Mato Grosso do Sul), Paraguay, Argentina and southeastern Bolivia.

*Doryopteris majestosa* occurs in different ecological habitats from the Atlantic, Parana pine (south Brazil), Galery and secondary forests, alongside streams, slopes of mountains or usually along forest borders. The species has usually been found growing in rather large populations when compared to other species of the genus *Doryopteris*. Therefore, I do not believe that the species suffers from any strong threat.

**SPECIMENS EXAMINED.**—BRAZIL. **Bahia:** *T. S. Santos et al.* 4121 (US); *M. Blanchet* s.n. (G). **Espirito Santo:** *A. C. Brade et al.* 18503 (RB). **Rio de Janeiro:** *Luetzenberg* 12917 (M, S); *R. M. Tryon & A. Tryon* 6620 (BM, GH); *C. Rizzini* 452 (RB); *A. C. Brade* 12709 (RB); *A. C. Brade* 9495 (BM). **Minas Gerais:** *Mosén* 2082 (B, K, M, S); *T. Santos* 4121 (US); *G. Lindberg* 601 (B); *Regnell* 329 (BR, U); *E. P. Heringer* 5709 (M); *L. S. Leoni* 745 (UC). **São Paulo:** *M. Kuhlmann* 804

TABLE 1. Main morphological features to distinguish *Doryopteris majestosa* from *D. nobilis*.

CHARACTERS	<i>D. majestosa</i>	<i>D. nobilis</i>
<b>Proliferous buds at the base of the lamina</b>	present (Fig. 1E)	absent
<b>Size of the fertile frond (length in cm)</b>	frond up to 80, lamina up to 30	frond 55–60; lamina up to 45
<b>Size of the sterile frond (length in cm)</b>	frond up to 46, lamina up to 29	frond 35–40 long; lamina 30
<b>Petiole shape (especially towards base of the lamina)</b>	terete (rarely sub-terete),	predominantly sulcate,
<b>Petiole colour</b>	brown to dark red-brown,	red to light red-brown,
<b>Petiole indument</b>	pubescent (ferruginous hairs, Fig. 1F), with denser indument towards the base of the lamina (Fig. 1G) and scales (Fig. 1B)	with hairs usually on the upper side of the petiole and more concentrated towards the base of the lamina
<b>Indument on the adaxial surface of the lamina</b>	pubescent, denser at the base of the lamina, extending on the main axes (Fig. 1G)	puberulous to glabrous, hairs scattered along the main axes
<b>Indument on the abaxial surface of the lamina</b>	glabrescent, with glandular hairs and scattered microscales along the axes	glabrescent and with microscales usually concentrated at the base of the lamina
<b>Margin of sterile tips of the fertile lamina and/or margin of the sterile lamina</b>	predominantly serrate (Fig. 1D)	predominantly dentate
<b>Size of the sterile tips of the fertile lamina</b>	usually long (up to 1 cm) (Fig. 1D)	short to medium (up to 0.7 mm)
<b>Spores in light microscope (color en masse) and SEM</b>	light castaneous (whitish), cristate (cristae with threads) (Fig. 3A)	light castaneous (golden), sparsely cristate (cristae lamellate) (Fig. 3B)
<b>Spore size (in <math>\mu\text{m}</math>)</b>	30–35	27.5–30
<b>Sporangium, size (in mm)</b>	up to 0.4, with stalk almost same length as capsule	up to 0.3, with stalk ca. 2/3 of capsule length,
<b>Distribution (Fig. 4)</b>	in Brazil, from Bahia down to Rio Grande do Sul states, towards Paraguay, Argentina and Bolivia	only in Brazil, usually along coastal rainforest, from Bahia to Santa Catarina states.

(SP); *M. Kuhlmann 1053* (SP); *C. Duarte s.n.* (SP); *F. C. Hoehne s.n.* (SP) *H. Luederwaldt 21312* (SP); *H. Luederwaldt s.n.* (SPF); *O. Yano 3663* (SP); *F. Tamandare & A. C. Brade 6516* (SP); *A. C. Brade 8599* (UC); *Duarte 4979* (S); *M. R. Silva, 400* (MO, PACA, SPF); *M. R. Silva, 1571* (SPF); *Guedes 72* (NY); *M.*

*Albricht 130* (NY); *A. B. Joly 841* (RB, SPF). **Mato Grosso do Sul:** *A. Sehnem 8063* (PACA). **Paraná:** *G. Hatschbach 21520* (MBM, MO, PACA); *G. Hatschbach 24144* (C, PACA, S, UC, US); *G. Hatschbach & O. Guimaraes 19338* (C); *G. Hatschbach 21520* (PACA, MO); *P. Dusen 11621* (S); *G. Hatschbach & E. Perreira 10406* (PACA); *J. R. Pirani et al. 406* (SP); *O. S. Ribas & J. M. Silva 109* (B); *J. C. Lindenam & J. H. Hass 3357* (B, U); *J. C. Lindenam & J. H. Hass 4969* (GH, U); *J. C. Lindenam & J. H. Hass 1219* (BM, RB, U); *E. Perreira 5322* (B); *Reis 129* (GH); *A. C. Cervi 2536* (NY); *A. P. Duarte & E. Pereira 1678* (NY, RB); *U. A. Dietrich & C. Kazera 168* (NY); *E. Pereira 7790* (M); *A. Sehnem 971* (NY); *G. Tessman 26* (RB); *G. Tessman 6026* (BR); *J. R. Pirani et al. 406* (SPF); *J. Cordeiro & J. M. Silva 436* (S, UC); *C. B. Poliquesi & J. Cordeiro 304* (UC). **Santa Catarina:** *M. Klein 7982* (PACA); *Reitz & Klein 6673* (PACA, US); *R. Reitz c427* (RB); *R. Reitz 4723* (BM); *J. R. Pirani et al. 450* (SP, SPF); *Spanagel s.n.* (NY, SP, UC); *B. Rambo 49940* (S); *A. Schmalz 4* (MO, NY); *H. Gauthier s.n.* (RB); *L. B. Smith et al. 9614* (US). **Rio Grande do Sul:** *A. Sehnem 3330* (B, C, GH, PACA, US); *A. Sehnem 3576* (C); *A. Sehnem 3574* (GH); *Brauner 148* (PACA); *A. Kunnert n.0* (B); *J. E. Leite 2186* (US); *J. E. Leite 2579* (SP); *J. E. Leite 706* (NY); *L. Stier 115* (S); *E. Hassler 5701b* (G, K); *E. Hassler 5388* (G); *C. A. M. Lindman 1019* (B, S); *C. Juergens 126* (GH, L, U, UC); *C. Juergens s.n.* (B, L, M, UC); *R. Reitz 81* (GH); *Mackhieske 9* (NY, UC); *B. Rambo 41710* (RB); *B. Rambo 42096* (RB).

**BOLIVA.** *T. Herzog 2* (US); *E. L. Ekman 26* (S). **Tablas-Thales:** *T. Herzog 2143* (L, M, UC). **La Paz:** *T. Plowman & E. W. Davis 5166* (GH); *M. Kessler et al. 10295* (UC). **Tarija:** *J. L. Solomon 10114* (NY, UC). **Chusquisaca:** *L. Amayo et al. 1000* (UC).

**PARAGUAY.** *E. Rojas 1813a* (GH); *P. Joergensen 4061* (GH). **Guarapi:** *B. Balansa 2842* (B, BM, C, G, GH; K, L, U); *E. Zardini 7885* (G); *E. Zardini 7772* (MO); *M. Ortiz 492* (G). **Caazapa:** *M. Ortiz 945* (MO); *R. Degen 1295* (MO). **Canindeyú:** *M. Penna-Chocarro 268* (BM). **La Soledade:** *T. Pedersen 5973* (C, K, L). **Serra Maracayí:** *E. Hassler 4372* (B, BM, G, GH, NY, UC); *E. Hassler 5701a* (B, BM, GH, NY). **Alto Paraguay:** *A. L. Woolston 707* (BM, NY, SP, S, U, UC). **Alto Paraná:** *K. Fiebrig 5796* (B, GH, US). **Itapuá:** *J. F. Casas & J. Molero 3738B* (MO, NY); *P. Joergensen 4062* (MO, NY, UC); *I. Bassualdo 002123* (MO); *M. S. Foster 7640* (UC). **Gran Chaco:** *C. A. M. Lindman 2077* (GH, NY); *T. M. Pedersem 5973* (GH); *F. Billiet & B. Jardin 3390* (BR).

**ARGENTINA.** *G. Niedulein s.n.* (B); *E. Hassler 782* (G). **Tucuman:** *J. E. Montes 2446* (MO); *L. Castilhum 23493* (GH); *S. Vemturi 9645* (GH, US); *F. Vervoorst & A. R. Cuzzo 7806c* (GH); *Lillo 2918* (GH); *S. Vemturi 1231* (U). **Misiones:** *J. E. Mortes 1673* (BM, C); *J. E. Mortes 10756* (MO); *J. E. Mortes 14743* (NY); *R. Huidabro 5540* (BM, MO); *F. O. Zulloaga et al. 5472* (MO); *A. Buskart 1355* (GH); *A. Scala 287* (GH); *T. Meyer 5498* (GH); *J. H. Henziker 908* (BM, RB); *J. Diem 1448* (UC); *Rodriguez 130* (G, UC). **La Laguna:** *E. Zardini & R. Velazques 15752* (MO); *A. G. Schulz 722* (GH); *L. Castilhum 41031* (U). **Salta:** *Willink 236* (U); *J. Novara 9999* (M). **Jujuy:** *Dinelli 41026* (U); *E.R. Sota 4481* (GH, US).

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